**B90DW Whisky Analytical Assignment**

**Introduction**

The project involves distillation of both a low wines from wash and a spirit from the previous group’s low wines.

**Aim**

Study the effect of run time on the concentration of the different congeners throughout the distillation run. Observe the way that the still behaves during the distillation and look at the analytical data you receive of the distillate throughout the course of a single distillation.

The processing of raw data is important by working your way through it longhand you will have a greater understanding if you ever encounter GC-FID in the wider world.

Each group will run a different low wines through the stills, the stills will be run at a constant flow rate and reflux. You will be presented with raw data and you will follow the step by step instructions in order to process this data. You are going to generate the curves needed to work out the concentrations within the distillate you have made.

Make comparisons between the analysed fractions, try and give reasoning for the observations in the data, and where possible draw upon relivant literature to back up the points you are making.

Samples will be taken throughout the run and the samples will be run through GC-FID analysis.

**Procedure**

Before filling the Wash Still and Spirit Still check they are empty and the drain valves in red are shut. Check the abv and volume of everything that is to be distilled, pour the wash and low wines into the vessel marked “Wash Still Charger” and “Spirit Still Charger” respectively, open the yellow product valves and ensure the still is charging.

1. Introduce steam to the wash still by opening the steam valves carefully and switch on the electrical element for the spirit still.
2. Once the wash still is established and stabilised periodically monitor the % abv of the distillate and cut at 1% abv.
3. The spirit still will heat up (eventually), you need to establish a flow rate of 60ml/min. Time the actual flow by recording the time taken to collect the various fractions and feedback to the rest of the group on the current flow rate.
4. During the spirit distillation run, collect fractions as follows:

a) 5 x 100ml (foreshots)

b) 9 x 300ml (spirit)

c) 1 x 500ml (feints)

1. Take a 1 ml sample with a pipette and transfer into an aliquot adding 100μl of the internal standard and screw on the black cap. There needs to be one sample from each fraction.
2. The samples to be sent for GC-FID need to be labelled with your group letter and the number of the sample. Mark this with a pen.

So for group Z your 6th sample would be Z6 put the sample in the blue trey provided.

You should have 15 Samples from the run at the end of the day.

**Assignment Brief**

You will need to write a report of your findings. Imagine I am the project manager and you are my best project engineer.

Your report should indicate

1. The commercial value and context of an experiment of this nature in industry.
2. The processing of the data gathered in the lab in an appropriate format.
3. The accurate calculation and correct presentation of the analytical data received.
4. An explanation of the differences observed between the samples with good quality reasoning from the data and peer reviewed literature available on the subject.

Pay careful attention to the presentation and discussion of your data and referencing.

Your report should be no more than 1000 words less is acceptable if all the points are covered. You may include an appendix if required.

**Submission**

Due in through Turnitin 11:57pm fourteen calendar days after the results are released to the group via Vision.

The assignment should be in pdf format and **the file name should include your name** to make it possible to mark.

## **Marking Criteria**

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| Criteria | Available Marks |
| Presentation: Does the page layout make sense? Appropriate use of section headings? Has illustrative material been used to provide an attractive document? | 10 |
| Commercial Value Evaluate the commercial value and context of an experiment of this nature in Industry | 10 |
| Relevant Primary Data Capture: Processing of relevant data captured whilst in the pilot distillery from first-hand experience | 25 |
| Processing of Raw Analytical Results  Processing the raw data you are issued with and turning it into a presentable and useable data set for easy and accurate interpretation. | 35 |
| Discussion of Relevant Chemical Characteristics of the Different Congeners  Research the chemicals observed in the analytical data and see if you can explain the results you observed, or can you explain what you expected and reasons why this did not occur. | 20 |
| Total marks | 100 |

Many Thanks

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